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GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



STEVEN E. CHESTER
DIRECTOR

TO: Water Well Drilling Contractors
Pump Installers
Local Health Departments
Attn: Environmental Health Directors
Field Sanitarians

FROM: Michael S. Gaber, Chief
Well Construction Unit
Drinking Water and Environmental Health Section

DATE: June 1, 2005

SUBJECT: (1) GPS Use for Water Well and Abandoned Well Plugging Record Completion
and (2) New Water Well and Pump Record Form

Many water well drillers are using Global Positioning Systems (GPS) to collect latitude and longitude for water well record completion. The low cost and accuracy of today's GPS units makes them a practical, reliable tool for well record completion. Those of you who have used the online Department of Environmental Quality (DEQ) Water Well Viewer at <http://wellviewer.rsgis.msu.edu> or the Michigan MapImage Viewer software quickly recognize the benefits of reporting accurate well locations. Some reasons for using GPS are:

- GPS is quicker and much more accurate than using county maps or plat books to find the well location.
- The current ¼, ¼, ¼ method is often done incorrectly.
- Accurate well locations will improve the quality of statewide aquifer maps.

The Department of Environmental Quality advises water well drilling contractors to begin using GPS to obtain latitude and longitude coordinates for well locations for water well records and abandoned well plugging records. Reporting latitude and longitude coordinates will be required on records submitted after December 31, 2005.

To assist the water well industry, the DEQ, Water Bureau, and the Michigan Ground Water Association are cosponsoring training sessions with hands-on GPS demonstrations. You are invited to attend one of the sessions on the enclosed schedule. There is no fee to attend. Online means of obtaining latitude and longitude coordinates without using GPS units will also be covered. If you will be purchasing a GPS unit, please refer to the enclosed information sheet for guidance. You may want to bring your GPS unit to the training.

Water well drilling contractors who currently use a GPS unit to collect latitude and longitude, will not necessarily need to attend the training. In addition, most drillers have been able to use their GPS unit by reviewing the unit instructions.

The enclosed new water well and pump record form has a space for entering latitude/longitude coordinates. By reporting latitude and longitude coordinates in decimal degrees, completing the section quarter fractions is unnecessary. Reporting the county, town, range, and section numbers will still be necessary. Please use up your existing supply of older water well record forms. ***The new form will be required for well records submitted after December 31, 2005.*** The new water well and pump record forms will be available at the training sessions or by contacting our office.

If you have any questions, please contact Anita Ladouceur at 517-241-1412, or Andrew LeBaron at 517-241-1435.

cc: Michigan Ground Water Association
Ground Water Advisory Committee



WELL DRILLING and GPS



What is Global Positioning System (GPS)?

Twenty-four Department of Defense satellites circle the Earth and transmit radio signals to Earth. GPS units take this information and pinpoint the user's exact location (latitude and longitude) on Earth. GPS is popular among hikers, hunters, and fishermen, just to name a few. GPS is also rapidly becoming commonplace in automobiles for both emergency roadside assistance and navigation.

Why should a well driller use GPS?

Obtaining exact locations on water wells drilled in Michigan is beneficial. It allows individuals to map geologic characteristics like depth to bedrock and water well characteristics like static water level, well depth, or flowing well areas. Accurate water well and pump record (well record) data results in more precise bid preparation by well drilling contractors. Once you learn to use GPS, you will find it to be simpler than figuring out the $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ of a section of land from plat books or county maps.

How accurate is a GPS unit?

Today's GPS units are extremely accurate. On average, GPS units are accurate to within 15 meters. Newer GPS units with WAAS (Wide Area Augmentation System) capability can improve accuracy to less than three meters. Tall buildings, dense foliage, and other sources can affect the accuracy.

What GPS unit should I purchase?

GPS units typically cost \$100 to \$400. The DEQ does not recommend one brand over the other; they all have about the same accuracy. All units show your position and basic navigation information. An inexpensive entry level unit would suffice for locating water wells. Choosing a unit with more features, like mapping detail, can improve your location awareness and navigation capability. Units with WAAS capability will be more accurate and are recommended. (*See back for GPS Unit Comparison Chart.*)

Where can I purchase a GPS unit?

GPS units are becoming more common place. In addition to hunting/fishing stores, GPS units can now be purchased at most large department stores and electronics stores.

If I collect GPS points on my well installations, are there any benefits to me?

Well drillers who enter GPS data into Wellogic **DO NOT** have to enter the $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ sections on the well record. Also, the wells that you collect latitude and longitude for will be able to be used on the Water Well Viewer website (<http://wellviewer.rsgis.msu.edu>) and by the DEQ for mapping purposes.

What do I need to know when reporting the latitude/longitude on the well record?

The latitude and longitude must be collected in Decimal Degrees. This setting is usually indicated in your GPS unit by dd.ddddd. (e.g., latitude = 42.1814320 and longitude = -84.2211770). The data collected and reported must have a minimum of 5 digits after the decimal point.

Can I obtain the latitude and longitude of a well without using a GPS unit?

Obtaining the latitude and longitude without using a GPS unit can be done, but in most cases, it is far less accurate and is much more time consuming. There are various mapping websites that allow you to retrieve the latitude and longitude. However, many of these sites do not allow for a reading of 5 digits after the decimal point, which is the minimum DEQ requires for accuracy. The DEQ Water Well Viewer allows you to retrieve the latitude and longitude in the correct format. Go to

<http://wellviewer.rsgis.msu.edu/viewer.htm> and zoom into an area. The scale at the bottom of the screen helps the user to obtain a more accurate well location. Click on the LAT/LONG ID tool, and then click on the map where the well is located. The latitude and longitude appear in red. The first number is the latitude and the second number (with the minus sign) is the longitude.

GPS Unit Comparison Chart:

[javascript:IB_openPopupWindow\('prodImageLg.asp?PRODID=1016',%20'ProductImages'%20'width=500,height=680'\);](javascript:IB_openPopupWindow('prodImageLg.asp?PRODID=1016',%20'ProductImages'%20'width=500,height=680');)

Model	WAAS Capability	Mapping Detail	MSRP
Garmin eTrex	No	No	\$100
Garmin eTrex Venture	Yes	Yes	\$124
Garmin eTrex Legend	Yes	Yes	\$169
Garmin eTrex Vista	Yes	Yes	\$289
Garmin GPS 60	Yes	No	\$190
Magellan Explorist 100	Yes	No	\$100
Magellan Explorist 200	Yes	Yes	\$140
Magellan Explorist 300	Yes	Yes	\$200
Magellan Sporttrack Pro	Yes	Yes	\$230
Magellan Meridian Gold	Yes	Yes	\$249



Note: There are many other GPS units available other than the 10 listed above. Visit www.garmin.com and www.magellangps.com for complete details.

For additional information, please email the Wellogic help at deq-dwr-wellogic@michigan.gov or call Anita Ladouceur at 517-241-1412.



GPS Workshop for Water Well Drilling Contractors



*July 20, 2005, 8:30 a.m.-11:00 a.m.
DEQ Office, 420 5th Street, Gwinn*

*July 20, 2005, 6:00 p.m.-8:30 p.m.
BJ's Restaurant, 990 North Center Avenue, Gaylord*

*July 26, 2005, 8:30 a.m.-11:00 a.m.
McGuire's Resort, 7800 Mackinaw Trail, Cadillac*

*July 26, 2005, 6:00 p.m.-8:30 p.m.
Allegan County Health Department, 3255 122nd Street, Allegan*

*August 11, 2005, 8:30 a.m.-11:00 a.m.
Strosacker Center for Human Services, 220 West Ellsworth, Midland*

*August 11, 2005, 6:00 p.m.-8:30 p.m.
Washtenaw County Dept. of Environmental Regulation, 705 North Zeeb, Ann Arbor*

(See back for addresses and maps to locations)

AGENDA

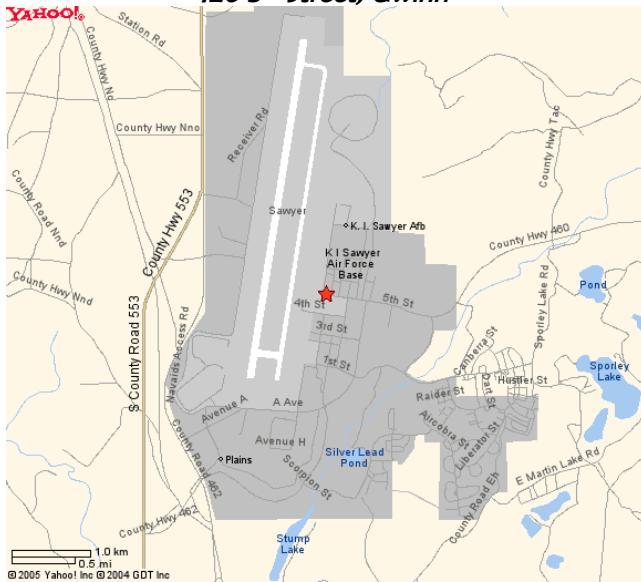
- I. Refreshments
- II. Welcome
Michigan Ground Water Association
- III. Background and Purpose of Workshop
Anita Ladouceur, DEQ
- IV. What is Global Positioning System and
Its Importance in Well Drilling
Andy LeBaron, DEQ
- V. Hands-On Outdoor Activity
- VI. Adjourn

Contact the DEQ at 517-241-1412 with questions.

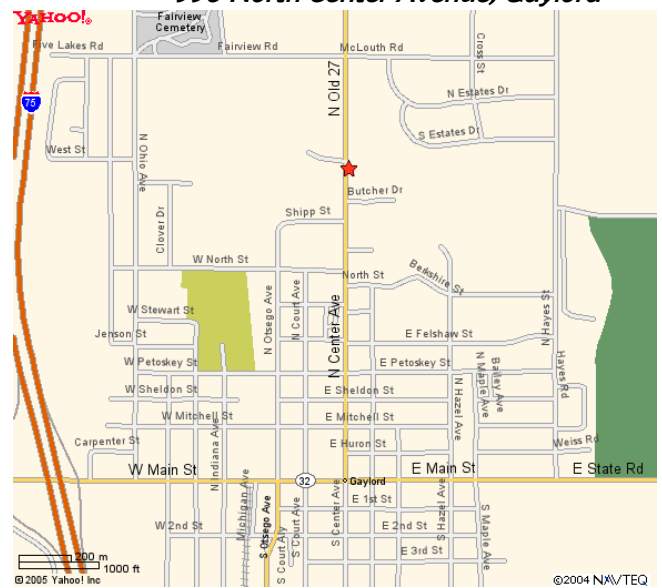
**Drillers don't forget to
bring your GPS units!**



420 5th Street, Gwinn



990 North Center Avenue, Gaylord



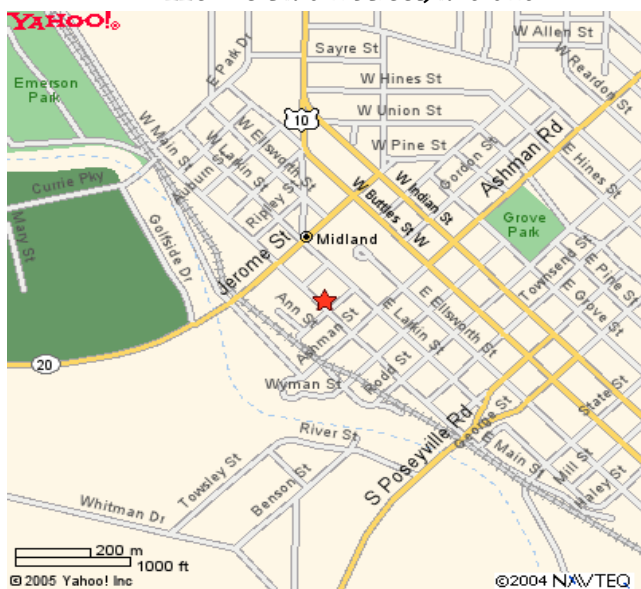
7800 Mackinaw Trail, Cadillac



3255 122nd Street, Allegan



220 West Main Street, Midland



705 North Zeeb Road, Ann Arbor

